DOCUMENT RESUME

ED 288 367 FL 017 007

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TITLE The Acquisition of Word Stress Rules in Spanish.
PUB DATE Apr 87
NOTE 9p.; In: Papers and Reports on Child Language Development, Volume 26; see FL 017 001.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Child Language; *Language Acquisition; *Linguistic Theory; Phonetic Analysis; Phonology; Preschool Children; Pronunciation; *Spanish; Spanish Speaking; Speech Acts; *Stress (Phonology); Suprasegmentals; Syllables
IDENTIFIERS Nonsense Words; *Spontaneous Speech

ABSTRACT

A study investigated the hypothesis that children learning Spanish as a first language learn rules for assigning stress, as opposed to simply memorizing stress for individual words. The subjects were 50 Spanish-speaking preschool children. In one portion of the experiment, they imitated sets of 2, 3, or 4 Spanish nonsense words that were segmentally identical but minimally contrasting in stress placement. The novel word sets contained regular/irregular stress contrasts in two- and three-syllable consonant- and vowel-final words and three prohibited stress types. In another portion of the experiment, spontaneous speech data containing a variety of word types were collected in an object-naming task. The imitation-task data clearly support the rule-learning hypothesis, and the spontaneous speech data support it somewhat less well. Results also suggest that the stress rule learning is essentially complete by age 3 because few age differences were found in the data. (MSE)

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PRCLD 26
1987

ED288367

THE ACQUISITION OF WORD STRESS RULES IN SPANISH

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Introduction

This paper tests the hypothesis that children learning Spanish as a first language learn rules for assigning stress, as opposed to simply memorizing stress on a word-by-word basis.[1] The general question of stress rule learning is of tri-fold interest to the psycholinguist (and, hopefully, to linguists in general). First, relatively little is known about the learning of phonological rules (as opposed to morphological and syntactic rules), since developmental phonology has focused more on children's <u>own</u> phonological rules, such as reduplication and consonant cluster simplification (see e.g. Smith 1973). Likewise, relatively little is known about children's mastery of suprasegmental aspects of phonology, including stress. Third, stress rules, unlike most phonological and morphological rules, capture generalizations about words as opposed to 'solving' alternations between different forms of the same word. As such, they pose a different, and, in some ways, less pressing problem to the child.

The acquisition of stress rules in Spanish is of particular interest because, while regularities in the stress system can be observed, the stress system is not so simple that its acquisition should be trivial; in fact, it has been suggested elsewhere that rule learning does not take place at all (Navarro-Tomas 1965:183). Stress on the penultimate syllable of vowel-final words (e.g., <u>cuchára</u> 'spoon'), and on the final syllable of consonant-final words (e.g., <u>tenedór</u> 'fork') is most frequent, and is therefore usually considered regular. However, stress can (and does) fall on any of the last three syllables of a word, regardless of the final segment of the word.[2]

In written text, the two regular stress types account for around 90% of Spanish non-verb tokens (Hooper & Terrell 1976: 67). However, this 90% figure probably overestimates the regularity of the speech heard by children, since some of the most common words (those meaning, <u>inter alia</u>, 'Mommy', 'Daddy', 'baby', 'here', and 'there') are irregular. Moreover, speech addressed to children and adults alike includes a substantial number of verb forms that violate the non-verb stress rules. Although children sort these out by age three or four (Graham 1977), their presence must at least initially further complicate the task of identifying the regular non-verb stress patterns.

In addition to learning which stress types are regular and which irregular, children must learn which types are prohibited entirely. Linguists (see especially Harris

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1983) have identified three such types:

1) stress located more than three syllables from the end of a word (e.g., *cátapana);

2) antepenultimate stress on words with a branching rhyme (e.g., a closed syllable) in the penultimate syllable (e.g., *sósenga);

3) antepenultimate stress on words with a branching rhyme in the final syllable (e.g., *pánaguil).[3]

Method

I took a two-pronged approach to gauging children's knowledge of the Spanish word stress rules. First, I had fifty Spanish-speaking children imitate novel Spanish words minimally contrasting in stress placement. The stimuli consisted of 35 sets of 2, 3, or 4 novel words that were segmentally identical but contrasted in stress placement. These 35 sets were further divided into seven groups of five sets each, based on their length and syllable structure. As shown in Table 1, four of these groups tested regular/irregular contrasts on two- and three-syllable consonant- and vowel-final words. The remaining three contrasted the three prohibited stress types (*cátapana, *pánaguil, and *sósenga) with segmentally identical words with regular and irregular stress. These novel words were presented in random order, and the children were asked to imitate them.

Table 1
Stimulus groups for the imitation experiment

1) 5 CVCV pairs
   e.g., gága, gagá
2) 5 CVCVCV triplets
   e.g., bóchaca, bocháca, bochacá
3) 5 CVCVC pairs
   e.g., guífor, guifór
4) 5 CVCVCVC pairs
   e.g., cabádon, cabadón
5) 5 CVCVCVCV quadruplets
   e.g., cátapana, catápana, catapána, catapaná
6) 5 CVCVCCV triplets
   e.g., sósenga, soséngа, sosengá
7) 5 CVCVCVC triplets
   e.g., pánaguil, panáguil, panaguíl

In addition to these imitated speech data, I also collected spontaneous data from the same children. In order to obtain a varied sample of word types, I had the

children name objects from a specially-made picture-book which included pictures of objects depicting words both long and short, regular and irregular.

The hypothesis that children learning Spanish do formulate stress rules led to two predictions about the data. The first was that children would find words with regular stress easier to pronounce than those with irregular stress (correspondingly, in the imitation task, words with irregular stress should be easier than those with prohibited stress). The second prediction was that rule knowledge should lead children to regularize stress in words with non-regular stress.

In order to test the first prediction, I measured ease of pronunciation for the different word types in both data sets, using as a metric the percentage of structure-changing errors made. These errors included deletion or addition of segments or syllables, stress shift, or metathesis: any error that did more than alter an individual segment. To test the second prediction, I further analyzed children's structure-changing errors according to the result of the error: whether the word became more regular (i.e., shifted from prohibited to irregular or regular, or from irregular to regular), more irregular (i.e., from regular to irregular or prohibited, or from irregular to prohibited), or exhibited no change in regularity.

The fifty subjects were 3-, 4-, and 5-year-old children from Redwood City, California. They were all Spanish-dominant, and spoke Spanish at home, though they displayed various degrees of proficiency in English.[4]

Results

The imitation data clearly support the rule-learning hypothesis. Consider first the percentage of structural errors that children made on the different stress types, as summarized in Table 2. Regular stress types were easiest to imitate: on vowel-final words children had the least difficulty with penultimate stress, while for consonant-final words, final stress was easiest. Moreover, children found the three prohibited types harder to imitate than comparable irregulars. They made more errors on *cátapana types than on catápana types (though not significantly more than on catapaná types, a point I shall return to below). And they made more errors on both *pánaguil (closed final) and *sósenga (closed penult) types than on bóchaca (open final and penult) types.[5]

Further support comes from considering the result of these structural errors. As Table 3 shows, the tendency was toward regularization. Specifically, words with regular stress were less likely to show a change in regularity than were irregulars, and these were, in turn, less likely to change than prohibiteds. This accounts for the high

percentage of prohibited words that became more regular (73%), as compared with the low percentage of regular words that became more irregular (23%). Moreover, for words with irregular stress, where a change in regularity could result in either a regular- or prohibited-stress word, structural errors were much more likely to go in the former direction than in the latter.

Table 2: Percent error on imitations
key: (r)=regular, (i)=irregular, (p)=prohibited

type (example)	stress				N
	´´´´#	´´´#	´´#	´#	
CVCV (gaga)	----	----	7(r)	23(i)	115
CVCVCV (bochaca)	----	20(i)	13(r)	32(i)	245
CVCVCCV (sosenga)	----	77(p)	42(r)	75(i)	250
CVCVCVCV (catapana)	56(p)	33(i)	14(r)	54(i)	130
CVCVC (guifor)	----	----	37(i)	18(r)	115
CVCVCVC (cabadon)	----	----	52(i)	22(r)	245
CVCVCVC (panaquil)	----	34(p)	48(i)	20(r)	250

Table 3: Results of errors on imitations

	stress type of imitated word		
result of error	regular	irregular	prohibited
became more regular	---	53%	73%
stayed the same	77%	41%	27%
became more irregular	23%	6%	---
no. of errors	291	745	352
(no.of imitations)	(1350)	(1725)	(630)

The only datum that is obstensibly unaccounted for under the rule-learning hypothesis is the fact, mentioned above, that children did not find prohibited-stressed words such as *cátapana to be significantly more difficult than comparable irregulars with final stress, such as catapaná. This fit in with a broader finding: long, vowel-final, final-stressed words were unexpectedly difficult in general. Like catapaná types, sosengá types were just as hard to imitate as corresponding prohibiteds (*sósenga types). And final-stressed bochacá and catapaná types were harder to imitate than the corresponding irregular, antepenultimate-stressed bóchaca and catápana types.

I have suggested elsewhere (Hochberg 1986, 1987) that this finding represents a problem not for the rule-learning hypothesis, but for current descriptions of Spanish stress. Children seem to have picked up on a hitherto unnoticed fact of Spanish: not all irregulars are created equal. Long V́# types are few and obscure; Whitley's extensive list (1976) of V́# words includes only six that are four syllables long. Of these, only one is common: israelí 'Israeli'. Of the remaining examples, one is borrowed and the others obscure: Misisipí, arracachá 'kind of plant', caracará 'kind of hawk', maravedí 'old Spanish coin', and zalamelé 'flattery' (Whitley 1976: 318). In contrast, many two-syllable V́# words are in common use, as noted in the Introduction. This case provides an excellent example, then, of how developmental language studies can provide new insight into the structure of a language.

We now turn to the spontaneous speech data. These also support the rule-learning hypothesis, though less robustly. Children made more structural errors on irregular words than on regulars (Table 4). Moreover, when they did make errors, they showed a tendency (albeit not statistically significant) toward regularization: they were more likely to regularize irregulars than they were to irregularize regulars. A problem with this latter result is that all two-syllable, vowel-final, final-stressed irregulars that children produced -- mamá, papá, bebé, café, and sofá -- have penultimate-stressed English cognates which some of the children undoubtedly knew. If one removes these words from the data (along with their two-syllable, vowel-final, penultimate-stressed regular counterparts (e.g., cása)) the tendency noted above disappears altogether, although the first result continues to hold (see Table 5).

Table 4: Data from children's spontaneous speech

	Stress	
	regular	irregular
% structural errors	7% (1227)	16% (425)
% structural errors resulting in a change in regularity	29% (80)	39% (67)

Table 5: Data from children's spontaneous speech (excluding two-syllable vowel-final words)

	Stress	
	regular	irregular
% structural errors	9% (710)	19% (303)
% structural errors resulting in a change in regularity	32% (66)	28% (57)

The most likely explanation of the difference between the imitated and spontaneous speech data is these children have mastered both the stress system and individual exceptions to it. Thus while they did find known irregular words somewhat harder to say than known regulars, their familiarity with these words enabled them to at least stress them correctly. In contrast, when confronted with novel words in the imitation task, the children were led by their rule knowledge to regularize irregulars.

Conclusions

Several conclusions can be drawn from this research. The first is that children did learn stress rules. They did so despite the fact that, as noted in the Introduction, stress rules are less crucial to language performance than are rules needed to control common alternations (e.g. morphophonemic variation between [s], [z], and [ɪz] in the English plural). Moreover, they learned the stress rules despite the relative opacity of the stress system. In this regard the Spanish stress case is reminiscent of Guillaume's (1927) observation that children learning French extend first conjugation (-er) verb endings to other verb types even though -er verbs are the least frequent type that children actually use. It seems that children's propensity to make generalizations and hypotheses about language is so strong as to take effect even when doing so

is neither necessary nor easy.

A second conclusion is that children's stress rule learning was essentially complete by age 3. I found few age differences in the data, and none that showed an increase in stress rule awareness. Children did improve with age in their pronunciation of both bochaca and sosenga types. Older children actually showed a lessened affect of stress on bochaca types, possibly because increased exposure to irregulars rendered these more acceptable by then. Given that the three-year-old children in my study were still making segmental phonological errors such as substituting [l] for /r/, and morphological errors such as regularizing se 'I know' to *sábo (on the model of the infinitive saber), this finding validates the general understanding that the suprasegmental domain is among the first that children master.

Finally, the difference between children's performance on imitated novel words and spontaneous known words raises an important methodological point. Taken alone, the spontaneous data would not provide robust confirmation of the rule-learning hypothesis. The powerful support for this hypothesis provided by the combination of spontaneous and imitated speech data underscores the benefit of using a variety of methodologies to approach any given question.

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1 This research was supported by Stanford University, NICHD 5R01 HD 18908, and NICHD HDMC 5 T32 HD07307-02 HLB. I am grateful to Eve Clark, Charles Ferguson, Paul Kiparsky, Rachel Mayberry, and Marilyn Vihman for many helpful criticisms and discussions. I am greatly indebted to the staff and students of the following Redwood City schools for their participation in my research: the Fair Oaks School, the Fair Oaks Children's Center, the Franklin's Children's Center, and the Peninsula Youth Center.

2 This description applies only to non-verbs (nouns, adjectives, adverbs, prepositions, and function words). Stress on verbs is morphologically governed, and is generally considered independently (see e.g. Harris 1983). My characterization of regular, irregular, and prohibited stress patterns is drawn from that of Harris 1983, which is the most descriptively accurate model available (see Hochberg 1987 for a comparison of Harris' and other models).

3 Antepenultimate stress with a closed final syllable is permitted, however, if that final syllable is outside the derivational stem of the word, as shown by its loss in derivation. For example, the -is of hipótesis 'hypothesis' drops when the adjectival suffix -ico is added to form the word hipotético 'hypothetical'.

[4] For a full discussion of statistical analyses used, see Hochberg (1986, and in preparation).

[5] One might ask whether children's greater difficulty with *sósenga and *pánaguil types (as opposed to bóchaca types) might be due to a general effect of the closed penultimate or final syllable, as opposed to an effect specific to antepenultimate-stressed words. As Table 3 shows, panaguil types were not in general harder than bochaca types, because the final consonant changed the regularity of the word. That is, regular panaguíl types were easier than irregular bochacá types, while irregular panáguil types were harder than regular bocháca types, and prohibited *pánaguil types were harder than irregular bóchaca types. In contrast, sosenga types were harder than bochaca types regardless of stress placement. Crucially, though, the difficulty posed by the closed penultimate was greater for antepenultimate-stressed words than for penultimate- or final-stressed words.

Graham, C. (1977). The development of linguistic stress in children learning Spanish as a first language. Unpublished Ph.D. dissertation, University of Texas at Austin.

Guillaume, P. (1927). Le développement des éléments formels dans le langage de l'enfant. Journal de psychologie 24:203-229.

Harris, J.W. (1983) Syllable structure and stress in Spanish: A nonlinear analysis. Cambridge, Massachusetts: MIT Press.

Hochberg, J.G. (1986) The acquisition of word stress rules in Spanish. Unpublished Ph.D. dissertation, Stanford University.

Hochberg, J.G. (1987). Acquisition data and phonological theory: the case of Spanish stress. To appear in Proceedings of the thirteenth annual meeting of the Berkeley Linguistics Society.

Hochberg, J.G. (in preparation). Evidence for rule learning in children's acquisition of Spanish stress.

Hooper, J.B., and T. Terrell. (1976). Stress assignment in Spanish: a natural generative analysis. Glossa 10:64-110.

Navarro Tomás, T. (1965). Manual de pronunciación española. Madrid: Consejo superior de investigaciones cientificas.

Smith, N.V. (1973). The acquisition of phonology: A case study. Cambridge: Cambridge University Press.

Whitley, S. (1976) Stress in Spanish: two approaches. Lingua 39:301-332.